

REMARKS

The Office Action dated August 11, 2004 has been carefully reviewed and the following remarks are made in consequence thereof.

Claims 1-4, 6-14, 16-24, and 26-29 are pending in this application. Claims 1-4, 6-14, 16-24, and 26-29 stand rejected. Claims 5, 15, and 25 have been canceled.

The rejection of Claims 1, 3, 4, and 6-10 under 35 U.S.C. § 102 as being anticipated by Sies et al. (U.S. Patent 6,225,716) "Sies" is respectfully traversed.

Sies describes a bracket 25 for the placement and protection of Hall element sensors. Bracket 25 includes a surface 51 having encasement structures 53 forming voids 55 into which the Hall elements may be positioned. Encasement structures 53 include a partially open front wall 63 which allows the magnetic transients of the sensing ring magnets free access to front surface 43 of Hall element 11 as the magnets pass before Hall element 11. Notably, bracket 25 is not a conductor, but a mounting bracket that partially encases and positions Hall elements accurately. Additionally, Sies describes Hall elements that are used for an electrical commutator assembly or other position locating device rather than Hall elements that are configured to detect a pre-determined shape of the magnetic field generated by current flowing through a conductor.

Claim 1 recites a current sensor for an apparatus wherein the current sensor includes "a conductor comprising an aperture therethrough and a plurality of Hall effect devices inserted at least partially within said aperture, said conductor is configured to generate a magnetic field having a pre-determined shape, each said Hall effect device configured to detect said pre-determined shape and generate an output."

Sies does not describe nor suggest a current sensor for an apparatus wherein the current sensor includes a conductor including an aperture therethrough and a plurality of Hall effect devices inserted at least partially within the aperture, and wherein the conductor is configured to generate a magnetic field having a pre-determined shape that is detected by the Hall effect device in combination with the Hall effect device generating an output in response to the detected field. Specifically, Sies does not describe nor suggest a current sensor including a conductor including an aperture therethrough. Rather, in contrast to the present

invention, Sies describes a mounting bracket that includes apertures formed therein to enable leads to extend therethrough to a Hall element mounted a distance from the apertures.

Additionally, Sies does not describe nor suggest a current sensor including a conductor that is configured to generate a magnetic field having a pre-determined shape wherein each of the plurality of Hall effect devices is configured to detect the pre-determined shape and wherein the Hall effect device generates an output in response to the detected field. Rather, in contrast to the present invention, Sies describes motor commutator assemblies sensing ring magnets, which pass before packaged Hall sensing elements. Applicants respectfully submit that motor commutator assemblies sensing ring magnets are not equivalent nor analogous to a conductor including an aperture as is described in the present invention. Accordingly, Claim 1 is submitted to be patentable over Sies.

Claims 3, 4, and 6-9 depend from independent Claim 1. When the recitations of Claims 3, 4, and 6-9 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 3, 4, and 6-9 likewise are patentable over Sies.

Claim 10 recites a current sensor for an apparatus including “a conductor including an aperture therethrough and a plurality of Hall effect devices inserted at least partially within said aperture, said conductor is configured to generate a magnetic field comprising at least a first magnetic field component having a first direction and a second magnetic field component having a second direction different from said first direction, and a pre-determined shape, each said Hall effect device configured to detect said pre-determined shape and generate an output.”

Sies does not describe nor suggest a current sensor for an apparatus including a conductor including an aperture therethrough and a plurality of Hall effect devices inserted at least partially within the aperture, and wherein the conductor is configured to generate a magnetic field including at least a first magnetic field component having a first direction and a second magnetic field component having a second direction different from the first direction, and a pre-determined shape wherein each Hall effect device is configured to detect the pre-determined shape in combination with the Hall effect device generating an output in response to the detected field. Specifically, Sies does not describe nor suggest a current sensor for an apparatus including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture nor a conductor that is configured to generate a magnetic

field that includes a pre-determined shape wherein each Hall effect device is configured to detect the pre-determined shape and wherein the Hall effect device generates an output in response to the detected field. Rather, in contrast to the present invention, Sies describes a mounting bracket that includes apertures formed therein to enable leads to extend therethrough to a Hall element mounted a distance from the apertures.

Additionally, Sies does not describe nor suggest a current sensor including a conductor that is configured to generate a magnetic field having a pre-determined shape wherein each of the plurality of Hall effect devices is configured to detect the pre-determined shape and wherein the Hall effect device generates an output in response to the detected field. Rather, in contrast to the present invention, Sies describes motor commutator assemblies sensing ring magnets, which pass before packaged Hall sensing elements. Applicants respectfully submit that motor commutator assemblies sensing ring magnets are not equivalent nor analogous to a conductor including an aperture as is described in the present invention. Accordingly, Claim 10 is submitted to be patentable over Sies.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1, 3, 4, and 6-10 be withdrawn.

The rejection of Claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Sies (U.S. Patent 6,225,716) in view of Dames et al. (U.S. Patent No. 6,414,475) is respectfully traversed.

Sies is described above. Dames et al. describe a fiscal electricity meter that includes sensing coils that sense current flowing through conductors within the meter. Notably, at Col. 1, lines 27-30, Dames et al. recite that “[t]he use of a Hall sensor suffers from the disadvantage that Hall sensors can suffer from temperature dependence and are also relatively expensive.” As such, there is no motivation to combine the cited references as Dames et al. teaches away from the claimed invention. Additionally, Applicants respectfully submit that one skilled in the art of residential electricity meters would not rely on nor be motivated to inquire into the art of electrical commutator assemblies or other position locating devices for teachings regarding measuring current flow through a conductor of an electricity meter.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by

combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Dames et al., nor Sies, considered alone or in combination, describes or suggests the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Dames et al. with Sies because there is no motivation to combine the references suggested in the art. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching. Rather, only the conclusory statement that "[i]t would have been an obvious to one having an ordinary skill in the art at the time the invention as made to modify the current sensor of Sies and use within the electricity meter of Dames et al. for the purpose of sensing current in the power line" suggests combining the disclosures.

Sies is cited for its teaching of a current sensor, and Dames et al. are cited only for their teaching of a current transformer in a residential meter. Applicants respectfully disagree with the assertion that Sies teaches a current sensor. Rather, Sies recites, the bracket is for "Hall elements such as may be used for an electrical commutator assembly or other position locating device." Applicants respectfully submit that an electrical commutator assembly or other position locating device is not equivalent nor analogous to a current sensor, and that the bracket and Hall element configuration described by Sies does not function as a current sensor. Moreover, neither Sies nor Dames et al., considered alone or in combination, describes or suggests a conductor including an aperture. Moreover, neither Sies nor Dames et al., considered alone or in combination, describes or suggests a plurality of Hall effect devices inserted at least partially within the aperture. Rather, Dames et al. teach away from Sies and the present invention. For example, at column 1, lines 27-30, Dames et al. recite, "[t]he use of a Hall sensor suffers from the disadvantage that Hall sensors can suffer from temperature dependence and are also relatively expensive."

Moreover, if art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit that Dames et al. teach away from Sies and the present invention, and as such, there is no suggestion or motivation to

combine Dames et al. with Sies, and Dames et al. teaching away from Sies supports the nonobviousness of the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claim 2 be withdrawn.

Further, and to the extent understood, neither Sies nor Dames et al., considered alone or in combination, describes or suggests the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 2 depends from Claim 1 which recites a current sensor for an apparatus wherein the current sensor includes “a conductor comprising an aperture and a plurality of Hall effect devices inserted at least partially within said aperture, said conductor is configured to generate a magnetic field having a pre-determined shape, each said Hall effect device configured to detect said pre-determined shape and generate an output.”

Neither Sies nor Dames et al. considered alone or in combination describes or suggests a current sensor for an apparatus wherein the current sensor includes a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture wherein the conductor is configured to generate a magnetic field having a pre-determined shape that is detected by the Hall effect device and wherein the Hall effect device generates an output in response to the detected field.

Specifically, neither Sies nor Dames et al., considered alone or in combination describes or suggests a conductor including an aperture. More specifically, neither Sies nor Dames et al., considered alone or in combination describes or suggests a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture.

Rather, in contrast to the present invention, Sies describes a mounting bracket that includes apertures for the leads of a Hall element to pass through, but Sies does not describe nor suggest conductor including an aperture therethrough and a plurality of Hall effect devices inserted at least partially within the aperture, and Dames et al. describe an electricity meter that uses coils to sense and transform current in a meter conductor and states that “[t]he use of a Hall sensor suffers from the disadvantage that Hall sensors can suffer from temperature dependence and are also relatively expensive.” Applicants respectfully submit that neither Sies nor Dames et al., considered alone or in combination, describe nor suggest

the claimed invention, and Dames et al. teach away from Sies and the present invention. Accordingly, Claim 1 is submitted to be patentable over Sies in view of Dames et al.

Claim 2 depends from independent Claim 1. When the recitations of Claim 2 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claim 2 likewise is patentable over Sies in view of Dames et al.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 2 be withdrawn.

The rejection of Claims 11-14, 16-24, and 26-29 under 35 U.S.C. § 103(a) as being unpatentable over Plis et al. (U.S. Patent No. 5,854,995) "Plis" in view of Sies et al. (U.S. Patent No. 6,225,716) "Sies" is respectfully traversed.

Sies is described above. Plis describes an electricity meter and methods for vector metering of electricity to sense line voltage and line current signals on a power line, convert the sensed signals into a digital signal, and compute vector metering quantities for the power line over a determined interval of orthogonality for the sensed line voltages and line currents. Vector computing means for computing vector metering quantities is implemented using a digital signal processor working in combination with a general-purpose microprocessor, integrated within an electricity meter.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143. Neither Plis nor Sies, considered alone or in combination, describes or suggests the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 11 recites a residential electricity meter including "a voltage sensor and a current

sensor, said current sensor comprising a conductor comprising an aperture and a plurality of Hall effect devices inserted at least partially within said aperture, said conductor is configured to generate a magnetic field having a pre-determined shape, each said Hall effect device configured to detect said pre-determined shape and generate an output.”

Neither Plis nor Sies, considered alone or in combination, describes or suggests a residential electricity meter including a voltage sensor and a current sensor wherein the current sensor includes a conductor that includes an aperture and a plurality of Hall effect devices inserted at least partially within the aperture, the conductor is configured to generate a magnetic field having a pre-determined shape that is detected by the Hall effect device and wherein the Hall effect device generates an output in response to the detected field.

Specifically, neither Plis nor Sies, considered alone or in combination, describes or suggests a residential electricity meter including a current sensor that includes a conductor including an aperture. Moreover, neither Plis nor Sies, considered alone or in combination, describes or suggests a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture.

Rather, in contrast to the present invention, Plis describes an electricity metering method for vector metering of electricity which sense line voltage and line current signals on the power line, convert the sensed signals into a digital signal, and compute vector metering quantities for the power line over a determined interval of orthogonality for the sensed line voltages and line currents, and Sies describes Hall element sensors used in an electrical commutator assembly or other position locating device. For at least the reasons set forth above, Claim 11 is submitted to be patentable over Plis in view of Sies

Claims 12-14 and 16-19 depend from independent Claim 11. When the recitations of Claims 12-14 and 16-19 are considered in combination with the recitations of Claim 11, Applicants submit that dependent Claims 12-14 and 16-19 likewise are patentable over Plis in view of Sies

Claim 20 recites a residential electricity meter including “a voltage sensor and a current sensor, said current sensor comprising a conductor comprising an aperture and a plurality of Hall effect devices inserted at least partially within said aperture, said conductor is configured to generate a magnetic field comprising at least a first magnetic field

component having a first direction and a second magnetic field component having a second direction different from said first direction, and a pre-determined shape, each said Hall effect device configured to detect said pre-determined shape and generate an output.”

Neither Plis nor Sies, considered alone or in combination, describes or suggests a residential electricity meter including a voltage sensor and a current sensor wherein the current sensor includes a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture, the conductor is configured to generate a magnetic field that includes at least a first magnetic field component having a first direction and a second magnetic field component having a second direction different from the first direction, and a pre-determined shape, the Hall effect device configured to detect the pre-determined shape and wherein the Hall effect device generates an output in response to the detected field. Specifically, neither Plis nor Sies, considered alone or in combination, describes or suggests a residential electricity meter including a current sensor that includes a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture. Rather, in contrast to the present invention, Plis describes an electricity metering methods for vector metering of electricity which sense line voltage and line current signals on the power line, convert the sensed signals into a digital signal, and compute vector metering quantities for the power line over a determined interval of orthogonality for the sensed line voltages and line currents and Sies describes Sies Hall element sensors used in an electrical commutator assembly or other position locating device. For at least the reasons set forth above, Claim 20 is submitted to be patentable over Plis in view of Sies

Claim 21 recites a method for sensing voltage and current in a residence wherein the method includes “providing an electricity meter comprising...a voltage sensor...a current sensor, wherein the current sensor includes a conductor that includes an aperture and a plurality of Hall effect devices inserted at least partially within the aperture, wherein the conductor is configured to generate a magnetic field having a pre-determined shape, and the Hall effect device is configured to detect the pre-determined shape and generate an output.”

Neither Plis nor Sies, considered alone or in combination, describes or suggests a method for sensing voltage and current in a residence wherein the method includes providing an electricity meter that includes, a voltage sensor, and a current sensor, wherein the current sensor includes a conductor that includes an aperture and a plurality of Hall effect devices

inserted at least partially within the aperture, wherein the conductor is configured to generate a magnetic field having a pre-determined shape, and the Hall effect device is configured to detect the pre-determined shape and wherein the Hall effect device generates an output in response to the detected field.

Specifically, neither Plis nor Sies, considered alone or in combination, describes or suggests a residential electricity meter including a current sensor that includes a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture.

Rather, in contrast to the present invention, Plis describes electricity metering methods for vector metering of electricity which sense line voltage and line current signals on the power line, convert the sensed signals into a digital signal, and compute vector metering quantities for the power line over a determined interval of orthogonality for the sensed line voltages and line currents and Sies describes Hall element sensors used in an electrical commutator assembly or other position locating device., but neither Plis nor Sies describes or suggests a conductor including an aperture and a plurality of Hall effect devices inserted at least partially within the aperture. For at least the reasons set forth above, Claim 21 is submitted to be patentable over Plis in view of Sies

Claims 22-24 and 26-28 depend from independent Claim 21. When the recitations of Claims 22-24 and 26-28 are considered in combination with the recitations of Claim 21, Applicants submit that dependent Claims 22-24 and 26-28 likewise are patentable over Plis in view of Sies

Claim 29 recites a method for sensing voltage and current in a residence wherein the method includes “providing a residential electricity meter comprising...a voltage sensor...a current sensor, said current sensor comprising a conductor comprising an aperture and a plurality of Hall effect devices inserted at least partially within said aperture, said conductor is configured to generate a magnetic field comprising at least a first magnetic field component having a first direction and a second magnetic field component having a second direction different from said first direction, and a pre-determined shape, each said Hall effect device configured to detect said pre-determined shape and generate an output.”

Neither Plis nor Sies, considered alone or in combination, describes or suggests a method for sensing voltage and current in a residence wherein the method includes providing a residential electricity meter that includes a voltage sensor, and a current sensor wherein the current sensor includes a conductor that includes an aperture and a plurality of Hall effect devices inserted at least partially within the aperture, the conductor is configured to generate a magnetic field that includes at least a first magnetic field component having a first direction and a second magnetic field component having a second direction different from the first direction, and a pre-determined shape that is detected by the Hall effect device and wherein the Hall effect device generates an output in response to the detected field.

Specifically, neither Plis nor Sies, considered alone or in combination, describes or suggests a residential electricity meter including a current sensor that includes a conductor that is configured to generate a magnetic field having a pre-determined shape and a plurality of Hall effect devices located within the conductor aperture that are configured to detect the pre-determined shape and wherein the Hall effect device generates an output in response to the detected field.

Rather, in contrast to the present invention, Plis describes an electricity metering methods for vector metering of electricity which sense line voltage and line current signals on the power line, convert the sensed signals into a digital signal, and compute vector metering quantities for the power line over a determined interval of orthogonality for the sensed line voltages and line currents and Sies describes Hall element sensors used in an electrical commutator assembly or other position locating device. For at least the reasons set forth above, Claim 29 is submitted to be patentable over Plis in view of Sies

In addition to the arguments set forth above, Applicants respectfully submit that the rejection of Claims 11-14, 16-24, and 26-29 under 35 U.S.C. § 103(a) as being unpatentable over Plis in view of Sies are further traversed on the grounds that the Section 103 rejection of the presently pending claims does not show some suggestion or motivation to combine Plis and Sies, nor is a reasonable expectation of success of the combination shown in the cited references. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. Neither Plis, nor Sies, considered alone or in combination, describes or suggests the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to

combine Plis with Sies because there is no motivation to combine the references suggested in the art. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching. Rather, only the conclusory statement that "[i]t would have been an obvious to one having an ordinary skill in the art at the time the invention as made to modify the current sensor within the electricity meter of Plis et al. and use within the current sensor of Bruchmann (sic) for the purpose of sensing current in the power line" suggests combining the disclosures.

Applicants respectfully disagree with the assertion that Sies teaches a current sensor. Rather, Sies recites, in the abstract, the bracket is for "Hall elements such as may be used for an electrical commutator assembly or other position locating device." Applicants respectfully submit that an electrical commutator assembly or other position locating device is not equivalent nor analogous to a current sensor, and that the bracket and Hall element configuration described by Sies does not function as a current sensor. Applicants respectfully submit that there is no motivation to combine Hall elements configured to determine the position of a motor rotor for commutation purposes with the current sensor described in Plis for the purpose of sensing power in the power line. Neither Plis nor Sies describe nor suggest that a Hall element configured for an electrical commutator assembly or other position locating device may be modified to function as a current sensor. There it would not be obvious for one skilled in the art to combine Plis and Sies.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.


Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a

given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Plis is cited only for their teaching of an electricity meter that includes a voltage sensor and a current sensor and Sies are cited for their teaching of Hall elements such as may be used for an electrical commutator assembly or other position locating device. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 11-14, 16-24, and 26-29 be withdrawn.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 11-14, 16-24, and 26-29 be withdrawn.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully requested.

Respectfully Submitted,



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